REMEDY ENERGY SERVICES INC.

February 1, 2022

Subject : Decommissioning of the below listed wellbores associated with the Alton Natural Gas Storage (ANGS) Project

Alton BH #1 (Well 14-01)

Alton BH #2 (Well 14-02)

Alton BH #3 (Well 14-03)

Preamble

Remedy Energy Services has been contracted to provide technical and operational assistance to decommission the wells that were drilled and intended for use as salt caverns in the above referenced project. Remedy was requested to ensure the wellbore abandonment process is conducted in compliance with CSA Z341.2-18 section 13. To that end we have prepared a work procedure outline and well as a review of the applicable section of the standard and noted how the program complies with that standard.

Summary

The objective of the below stated work program is to safely and effectively decommission the three (3) existing wellbores located at the Alton Gas site. The decommissioning will leave the well bores "abandoned" in compliance with all applicable specifications of CSA Z341.2-18 section 13.

The present mechanical status of a typical wellbore is shown in Figure 1. The decommissioning of the wellbores will leave the wellbores as shown in Figure 2. This abandonment will maintain the integrity of the salt of the Stewiacke formation and will ensure no deleterious effects caused by the wellbores.

Well 14-02 and 14-03 have been idled since January 2015. A borehole pressure test was conducted on Well 14-01 in the summer of 2016. The wellbore has been idled since that time.

Procedure Outline

The decommissioning of the wellbores will be performed as described in the following procedure outline. Comprehensive QHS&E processes will be followed, and meticulous records will be maintained. Detailed procedures will be created for each of the below steps and will be used by the onsite personnel to ensure compliance with the standard.

1. Run a temperature log one month prior to beginning the abandonment process. This will serve to determine the temperature at depth and, that the internal tubing string is open to depth.
2. Sample the immediate atmosphere around the wellheads for presence of combustible or hazardous gases. As there is no active hydrocarbon system in this area it is anticipated there will be no gas present.

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3. Check the wellhead outlets for pressure to verify that there is no pressure present within the wellbore. It is anticipated there will be little to no pressure present as the wellbore is cased and open only to the salt.
4. Test the surface casing vent for evidence of flow.
5. One month after the first log, run a second temperature log.
6. Circulate fresh water through all annuli to ensure hydraulic communication within the wellbore. This will be conducted after the second temperature log to avoid influencing the bottom hole static temperature prior to running the log.
7. Install a back pressure valve in the wellhead to allow safely removing the wellhead to allow installation of the well control assembly (BOP) of a service rig.
8. Position and rig up the service rig.
9. Remove the wellhead and install the BOP and function and pressure test all components.
10. Remove the inner/smallest tubing string from the well.
11. Remove the outer/larger tubing string from the well.
12. Run a casing scraper to the bottom of the production casing to ensure full diameter access to the depth of the end of the intermediate casing.
13. Run an ultrasonic casing and cement evaluation log to the bottom of the production casing to confirm the condition of both these well barrier elements.
14. Install a permanent bridge plug at the bottom of the production casing and pressure test the plug and casing to the maximum anticipated pressure requirement to demonstrate casing integrity.
15. Run into the wellbore with tubing and circulate oil well cement into the wellbore in stages. Confirm the placement of each stage (tag the plug) prior to placing the next stage.
16. Continue placing cement in stages until the top of the cement is located 3 meters below ground level.
17. Remove the BOP and move off the service rig.
18. Excavate the area around the wellhead to a depth of 1.5 to 2 meters depending on ground conditions.
19. Using confined space entry practices, cut the casing strings such that the cut off top of the casing will be 1.5 meters below ground level.
20. Install a vented cap on the outer casing string such that all casing strings are covered. The abandonment date, well licence number and well name will be permanently inscribed on the cap.
21. Backfill the excavation and mark same with survey marker.

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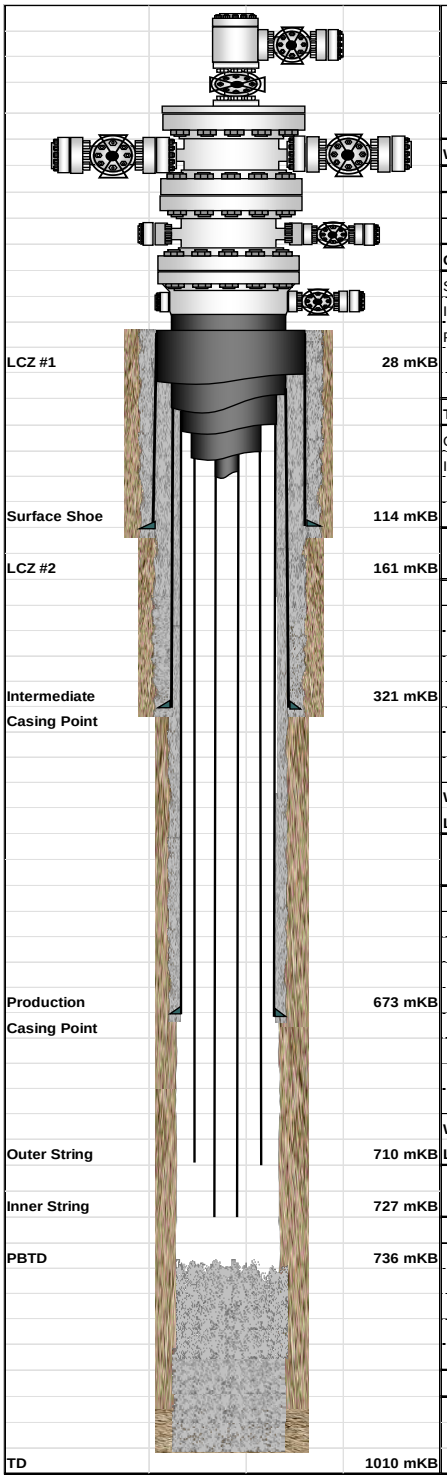

ALTON NATURAL GAS STORAGE

Typical Existing Downhole Well Profile, depths and diameters may vary well to well

WELL NAME	Alton Natural Gas Storage Cavern #3			DATE	2014-`15

ELEVATIONS (meters)

KB ELEV	GL ELEV	KB TO THF	KB TO SCF	KB TO GL	PBTD
56.15	49.95	3.95	5.80	6.20	

CASING DESCRIPTION	OD (mm)	# OF JOINTS	WEIGHT (kg/m)	LANDED DEPTH
Surface Casing - J55, BTC	406.4	9	111.6	114.00
Intermediate Casing - TN80TH, Blue	298.45	26	89.29	321.00
Production Casing - L80, Wedge 523	244.5	50	79.62	673.00

TUBING DESCRIPTION	OD (mm)	# OF JOINTS	WEIGHT (kg/m)	LANDED DEPTH
Outer String - J55, LTC	177.8	55	34.22	710.00
Inner String - J55, FJ-AT	114.3	79	17.26	727.00

DOWNHOLE DESCRIPTION FROM BOTTOM UP (Outer String)

ITEM #	DESCRIPTION	LENGTH	BOTTOM OF (mKB)
1	1- Cut down joint	4.25	710.00
2	54 joints of 177.8mm, J55, 34.22 kg/m, LTC	700.96	705.75
			-
			-
			-
			-
			-

WEIGHT OF TUBING STRING (daN)	23,700	TOTAL STRING LENGTH (m)	705.21
LANDED STRING WEIGHT (daN)	23,700	TUBING BOTTOM (mKB)	710.00

DOWNHOLE DESCRIPTION FROM BOTTOM UP (Inner String)

ITEM #	DESCRIPTION	LENGTH	BOTTOM OF (mKB)
1	1- Cut down joint	1.50	727.00
2	77 joints of 114.3mm, J55, 17.26 kg/m, FJ	716.65	725.50
3	1- Pin to pin pup joint (FJ x LTC)	4.47	8.85
			-
			-
			-
			-
			-

WEIGHT OF TUBING STRING (daN)	12,300	TOTAL STRING LENGTH (m)	722.62
LANDED STRING WEIGHT (daN)	12,300	TUBING BOTTOM (mKB)	727.00

WELLHEAD DESCRIPTION

ITEM #	DESCRIPTION	SERIAL #	MWP	SIZE
1	Casing Bowl	232283-3	3000 #	346.1 x 298.45
2	Tubing Head (177.8 mm Tubing)	239813	3000 #	346.1 x 346.1
3	Tubing Head (114.3 mm Tubing)	232070-3	3000 #	346.1 x 279.4
4	Crown Adapter Tubing Head	231937-3	3000 #	279.4 x 130.2
5	Crown Tee	231944-3	3000 #	130.2 x 130.2

REMARKS

Figure 1: Present Wellbore Schematic of Well 14-03

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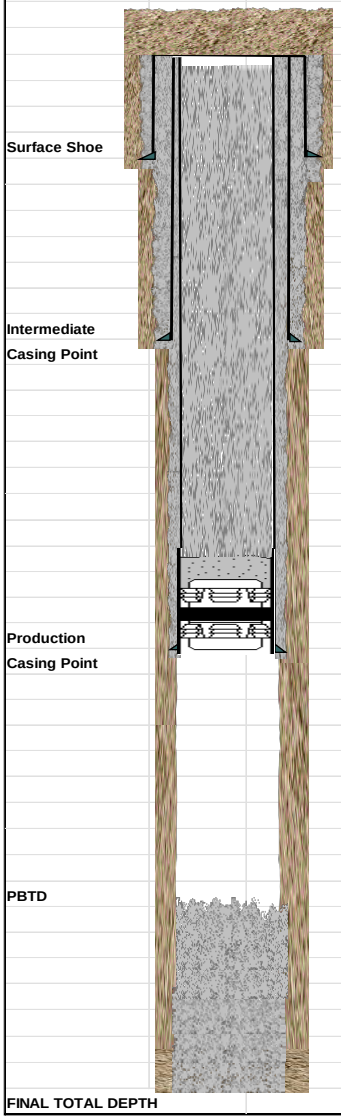

ALTON NATURAL GAS STORAGE

Typical Decommissioned Downhole Well Profile

WELL NAME	Alton Natural Gas Storage Cavern			DATE	2022
ELEVATIONS (meters)					
KB ELEV	GL ELEV	KB TO THF	KB TO SCF	KB TO GL	PBTD
56.145+E9:J9F6E9:I9	49.95	3.95	5.80	#VALUE!	

CASING DESCRIPTION	OD (mm)	# OF JOINTS	WEIGHT (kg/m)	LANDED DEPTH

TUBING DESCRIPTION	OD (mm)	# OF JOINTS	WEIGHT (kg/m)	LANDED DEPTH

DOWNHOLE DESCRIPTION FROM BOTTOM UP (Outer String)

ITEM #	DESCRIPTION	LENGTH	BOTTOM OF (mKB)
			-
			-
			-
			-
			-

WEIGHT OF TUBING STRING (daN)		TOTAL STRING LENGTH (m)	
LANDED STRING WEIGHT (daN)		TUBING BOTTOM (mKB)	

DOWNHOLE DESCRIPTION FROM BOTTOM UP (Inner String)

ITEM #	DESCRIPTION	LENGTH	BOTTOM OF (mKB)
			-
			-
			-
			-
			-

WEIGHT OF TUBING STRING (daN)		TOTAL STRING LENGTH (m)	
LANDED STRING WEIGHT (daN)		TUBING BOTTOM (mKB)	

WELLHEAD DESCRIPTION

ITEM #	DESCRIPTION	SERIAL #	MWP	SIZE

REMARKS

Figure 2: Final Wellbore Schematic of Well 14-03 after Abandonment

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Section 13 of CSA Z341.2-18 addresses the abandonment of gas storage caverns. To demonstrate compliance with the standard a review of the above program was conducted. The result of that review is presented below.

13 Pre-abandonment monitoring, plugging and abandonment, and post-abandonment monitoring

13.1 General

Plugging and abandonment refers to two activities - wellbore abandonment and cavern system abandonment. Where the cavern system is to be abandoned, the cavern shall be suspended from service for a period of time to collect data used to determine when the cavern will be in a state of static equilibrium such that abandonment can occur. Where just a wellbore is to be abandoned and the cavern will be accessed via additional wellbore entries, then the cavern is not required to be suspended from service.

13.2 Pre-abandonment activities

13.2.1 Preparation for stabilization period

Where a storage cavern is taken out of service in preparation for stabilization and monitoring then the following shall apply:

a) a risk analysis shall be conducted to evaluate the potential impact of the cavern pre-abandonment activities;

This will be done as part of the detailed planning.

b) all hydrocarbons shall be withdrawn from the cavern and the operator shall ensure that fluids across the production casing are non-corrosive;

No hydrocarbons were stored, and none are present. All fluids in the casing will be displaced by the cement plug placement process.

c) all flowlines to the cavern shall be disconnected except for those required for the withdrawal or injection of fluid, or management of pad fluid;

This will be done as part of the abandonment process.

d) casing integrity shall be demonstrated as follows:

i) casing leaks shall be evaluated; and

A casing integrity log will be run as one of the first steps of the abandonment process. A casing pressure test will be conducted prior to final abandonment.

ii) casing leaks that are deleterious shall be eliminated prior to the monitoring period; and

Any deleterious casing leaks will be eliminated prior to abandonment.

e) wellhead integrity shall be demonstrated as follows:

i) regular wellhead maintenance, inspection, and integrity testing shall be conducted; and

Any components of the wellhead which will be on the well during the abandonment process will be pressure tested. Once the well is abandoned, all well head components will be removed as part of the "cut and cap" process.

ii) wellhead leaks shall be repaired.

This will be repaired if leaks are found.

13.2.2 Stabilization and monitoring activities

During the stabilization period, the following activities shall be undertaken:

a) cavern pressures shall be monitored regularly and recorded on a monthly basis. The frequency shall be increased to hourly or daily, depending upon the pressure collection method, for the three-day period immediately after fluid has been withdrawn from the cavern. If monitoring is with surface gauges, a digital pressure data recorder or one of equivalent accuracy, shall be used;

Given the length of time that the wellbores have been idled, the pressures will have stabilized. Pressure will be monitored a month prior to abandonment process to confirm stabilization.

b) brine shall periodically be injected or withdrawn to maintain the brine pressure in a range that exceeds 0 kPa at surface, but is less than 65% of the fracture gradient at the shoe;

Pressures will be monitored prior to abandonment to confirm compliance to this condition.

c) the date, volume, and type of fluid injected or withdrawn and the final cavern pressure shall be recorded;

This data will be recorded and stored in the permanent well file.

d) downhole cavern temperatures shall be obtained annually throughout the pre-abandonment monitoring period prior to abandonment until such time that a longer frequency is suitable; Note: Wireline logs or installed downhole gauges may be used.

Bottom Hole Static Temperature will normally stabilize in a wellbore in hours to days depending on downhole conditions. Given the length of time the wellbores have been idled, the temperature has stabilized. A wireline temperature log will be run one month and immediately prior to the abandonment to confirm stabilization.

e) any subsidence monitoring program associated with the cavern shall continue throughout the pre-abandonment monitoring period;

Since no caverns were developed the wellbore void space is too small to impact surface elevation change.

Well 14-01 – 270 mm size (open hole) from 851 m to 954 m

Well 14-02 - 270 mm size (open hole) from 905 m to 968 m

Well 14-03 – 270 mm size (open hole) from 673 m to 736 m

f) surface casing vent flow shall be monitored throughout the pre-abandonment monitoring period. If vent flow is detected and will affect cavern stabilization, it shall be eliminated prior to or during the monitoring period;

The surface casing vent will be checked for flow prior to abandonment.

g) if any casing leaks are identified they may be eliminated during the monitoring period;

Any deleterious casing leaks will be repaired.

h) if migration of fluids from the cavern is occurring beyond the wellbore, wells might be required for monitoring and/or remediation; and

Potential for fluids migration will be checked during the abandonment process. As no caverns were developed and no storage was implemented there is exceptionally low possibility of this occurring.

i) sufficient pressure and temperature data shall be collected to support the risk analysis specified in Clause 13.3 a) and make the predictions required by Clause 13.3 b).

Pressure and temperature data will be collected. As no caverns were developed and the wellbores have been static for several years this data should indicate that there is no elevated risk.

13.3 Requirements for cavern abandonment

A salt cavern shall be considered in a state of static equilibrium and suitable for abandonment only after the following:

a) a risk analysis has been conducted to evaluate the impact of the cavern abandonment;

A risk analysis will be performed prior to abandonment.

b) predictions have been made to demonstrate that the abandonment will not result in pressure build-up within the cavern that causes an adverse impact on porous formations containing hydrocarbons, non-saline aquifers, or existing adjacent caverns. Geomechanical modelling of the pressure and temperature data collected during the pre-abandonment monitoring period might be required to determine the cavern's natural closure characteristic, the time to static equilibrium, and the post-abandonment maximum pressure;

Evaluation will be conducted to verify that pressure build up did not cause adverse effects. Pressure and temperature data collected will be used to make these predictions. As no caverns were developed and the wellbores have been static for several years this data should indicate that there is no elevated risk.

c) All hydrocarbons have been withdrawn from the cavern;

Hydrocarbons were never introduced into the wellbores.

d) Sufficient cavern pressure and temperature data has been obtained during the pre-abandonment monitoring period outlined by Clause 13.2.2 to address the risks identified by Clause 13.3 a) and make the predictions required by Clause 13.3 b);

Pressure and temperature data will be collected. As no caverns were developed and the wellbores have been static for several years this data should indicate that there is no elevated risk.

e) A sonar survey has been conducted within one year prior to abandonment;

A caliper log was run immediately after drilling was completed. This data is more applicable than a sonar survey which would be run only if a cavern had been developed.

f) If communication exists between adjacent caverns, one cavern shall not be abandoned when it is communicating with an operating cavern(s). The communicating caverns shall be abandoned together. The risk analysis conducted in Clause 13.3 a) and predictions conducted in Clause 13.3 b) shall take into consideration the inter-cavern communication.

As no caverns were developed and the wellbores have been static for several years the data should indicate no risk of communication between wellbores. The pressure temperature data will be assessed to ensure this is the case.

13.4 Wellbore abandonment

13.4.1 Abandonment design criteria

Storage wells shall be abandoned in a manner that

a) isolates all existing storage zones from the immediate wellbore area;

The storage zone in these wells is the salt however, no storage was ever developed. The abandonment will completely isolate the salt from all shallower formations.

b) protects against pollution and isolates all zones of non-saline water;

A cement integrity log will be run to verify the result of the logs run several years ago. This data will be used to ensure isolation of all non-saline water bearing formations in compliance with the CSA standard.

c) prevents the migration of hydrocarbons or water from one horizon to another;

The abandonment will completely isolate the salt from all shallower formations. The cement integrity log will be used to also evaluate this. Any potential migration will be addressed per the CSA standard.

d) isolates all formations bearing oil, gas, geothermal resources, and other prospectively valuable minerals from zones of non-saline water;

The abandonment will completely isolate the salt from all shallower formations and prevent any other formation fluids or minerals from entering zones of non-saline water. This will be done in compliance with the CSA standard.

e) prevents the escape of oil, gas, or other fluids to the surface or to zones of non-saline water;

The abandonment will completely isolate the salt from all shallower formations and prevent any other formation fluids, oil or gas, or minerals from zones of non-saline water. This will be done in compliance with the CSA standard.

f) isolates formations or groups of formations that appear to have abnormal pressures;

The abandonment will completely isolate the salt from all shallower groups or formations and prevent any other formation fluids or minerals from entering zones of non-saline water. This will be done in compliance with the CSA standard.

g) separates formations that contain fluids that are significantly different in nature from each other;

The abandonment will completely isolate the salt from all shallower formations as well as formations or different nature from each other and prevent any other formation fluids or minerals from entering zones of non-saline water. This will be done in compliance with the CSA standard.

The cement evaluation log will also verify the result of the logs run several years ago. This data will be used to ensure isolation of all non-saline water bearing formations as well as zones of significantly different in nature from each other in compliance with the CSA standard.

h) separates porous and permeable formations from other porous and permeable formations that are significantly different in age;

The abandonment will completely isolate the salt from all shallower formations as well as porous and permeable formations from other such formations and will prevent any other formation fluids or minerals from entering zones of non-saline water. This will be done in compliance with the CSA standard.

The cement evaluation log will also verify the result of the logs run several years ago. This data will be used to ensure isolation of all non-saline water bearing formations as well as porous and permeable formations from other such formations. This will be done in compliance with the CSA standard as part of the abandonment process.

i) separates lost circulation intervals in the well from other porous and permeable formations;

The original well logs and reports will be used to verify the presence of lost circulation zones. The cement evaluation log will also verify the result of the logs run several years ago. This data will be used to ensure

isolation of all lost circulation zones from porous and permeable formations. This will be done in compliance with the CSA standard as part of the abandonment process.

j) isolates the surface casing (or intermediate casing) from open holes below the casing seat; and

The well abandonment process uses both mechanical and cementitious plugs to ensure isolation of the lower open-hole section from the wellbore above and will isolate the intermediate casing. The surface casing is isolated from the lower wellbore section by way of the intermediate casing.

k) seals the well at the surface.

The well will be capped per the CSA standard once the abandonment has been completed. The well abandonment process uses both mechanical and cementitious plugs to ensure isolation of the lower open-hole section from the wellbore above and will isolate the intermediate casing. The surface casing is isolated from the lower wellbore section by way of the intermediate casing.

13.4.2 Wellbore abandonment requirements

Prior to abandoning a well bore

a) a cement integrity log shall be conducted within five years prior to abandonment;

A cement integrity log will be obtained as one of the first steps of the abandonment process.

b) a casing inspection log shall be conducted within one year prior to abandonment;

A casing inspection log will be obtained at the same time as the cement integrity log.

c) if fluid migration is suspected to be occurring behind the casing, then additional evaluation shall be conducted. If migration is occurring, then remedial cementing shall be conducted in accordance with Clause 7.4.13;

The possibility of fluid migration will be investigated by way of the cement integrity log, as well as the casing pressure test. If there is a fluid migration, it will be repaired per the CSA standard.

d) the casing shall be tested to a pressure that demonstrates that cement can be successfully placed within the wellbore during abandonment without compromising the casing integrity; and

The casing will be pressure tested as per CSA standard.

e) the source of any surface casing vent flow shall be determined and eliminated prior to abandonment.

The surface casing vent will be checked for flow prior to commencing the abandonment and any flow will be repaired per the CSA standard.

13.4.3 Wellbore abandonment

To abandon the wellbore

a) all downhole equipment and tubing strings shall be removed prior to commencing abandonment operations;

All downhole equipment and tubing strings will be removed.

b) if the casing has a known leak, it shall be squeezed with cement or similar product to eliminate it;

Leaks will be detected by way of the casing pressure test and will be repaired if leaks if present.

c) the cavern shall be isolated from the wellbore with a bridge plug located within 5 m above the casing seat or no shallower then the cap rock immediately above the salt zone; and

This will be completed in compliance with the CSA standard.

d) the plug shall be pressure tested to the maximum anticipated differential pressure across the plug. A successful pressure test shall have no more than a 3% drop during a 15 min period. The following shall apply:

This will be completed in compliance with the CSA standard.

i) for situations where the cavern is to remain in service after the wellbore is abandoned, the maximum allowable operating pressure of the cavern shall be taken into consideration for the determination of the test pressure; and

Caverns were never developed. The wellbores will be permanently abandoned. Test pressure will be based on the maximum allowable operating pressure which was established as part of the project development plan.

ii) in the event of a failed test, the leak path will be eliminated or an additional pressure test shall be conducted after the placement of each cement plug.

This will be done in compliance with CSA standard in the event of a failed test.

13.4.4 Cement placement

The well shall be in a static condition while placing each plug. Cement plugs shall be placed by the circulation or squeeze method through tubing, coiled tubing, or drill pipe. Placement shall be as follows:

a) place a series of balanced cement plugs to create a continuous column of cement from the bridge plug to the surface;

This will be done in compliance with CSA standard.

b) tag each plug to verify its location prior to setting subsequent plugs;

This will be done in compliance with CSA standard.

c) plugs shall be a minimum of 30 m long; and

This will be done in compliance with CSA standard.

d) if any casing is cut and recovered, a cement plug shall be placed to cover the open hole section and extend 15 m below the point at which the casing was cut.

A casing cut beyond the surface cut required by the CSA standard is not anticipated as part of this abandonment. If this is required, it will be done in compliance with the CSA standard.

13.4.5 Cement quality

Cement plugs shall

a) be neat, APl-approved, oil well cement without volume extenders. The exceptions are

i) salt-saturated cement across all salt formations;

This will be done in compliance with CSA standard.

ii) thermal cement across all bitumen-bearing formations; and

This will be done in compliance with CSA standard.

iii) special compositions across all high-temperature or highly corrosive formations;

This will be done in compliance with CSA standard.

b) have a compressive strength that can withstand the maximum cavern pressure anticipated after abandonment; and

This will be done in compliance with CSA standard.

c) be mixed in accordance with API standards.

This will be done in compliance with CSA standard.

13.4.6 Surface abandonment

The operator shall

a) cut all casing strings at a minimum of 1 m below ground level;

This will be done in compliance with CSA standard.

b) cover the outer casing string with a vented cap that precludes any pressure buildup inside the casing while also restricting access to the casing from surface;

This will be done in compliance with CSA standard.

c) permanently inscribe the abandonment date and well license number on the cap; and

This will be done in compliance with CSA standard.

d) maintain the well documents in accordance with Clause 10.1.6.

This will be done in compliance with CSA standard.

13.5 Post-abandonment monitoring

Following abandonment the operator shall

a) where it is required, maintain subsidence monitoring at the site until the risk of subsidence has become negligible;

As caverns were never developed the void space in the salt is too small to cause any surface elevation change. This will be done in compliance with the CSA standard.

b) conduct periodic site inspections, for the life of the storage facility; and

This will be done in compliance with the CSA standard. The facility will be decommissioned.

c) where a risk assessment has identified potential long-term risk, whether above or below ground, continue with the monitoring program defined by the risk assessment until the risk has become negligible.

If a long-term risk is identified this will be done in compliance with the CSA standard.